

FCS Embedded Training: An Overview

Chuck Moler
FCS LSI Training Systems IPT
12/13/2005

Training is THE factor in determining the victor.
***- DSB Task Force on Training Superiority and
Training Surprise***

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Leading Transformation

- The US Army “At War and Transforming”

- 781,000 to 480,000 active duty since 1990
- Army’s Transformation effort announced in Oct 1999
- Leading implementation of network-centric operations
- Driving Joint interdependency & standards



General Peter J. Schoomaker
Chief of Staff, U.S. Army

FCS is a Significant Opportunity to Support the Soldier

Training Enhancements

Current Force vs Future Force



Current Force

FCS Equipped BCT

Infrequent doctrine/TTP updates	Ability to rapidly update doctrine/TTP for deployed forces
Slow to adapt to needed changes	Respond quickly to the dynamic challenge
Constrained training capability when deployed	Ability to train 24/7 with no appended equipment while deployed or at Home Station
Appended TESS	Embedded TESS capability
Limited training support packages	Fully embedded Live, Virtual, Constructive, Multi-mode training capability
Limited Battle Command Training Capability	Embedded Battle Command Training capability
Custom SW for each application	<ul style="list-style-type: none"> - Product line approach to system development - Collective training capability - Basic load of Training Support Packages

FCS is providing a new capability that takes Training to the Soldier anywhere, anytime

Centerpiece: FCS Equipped BCT Capabilities

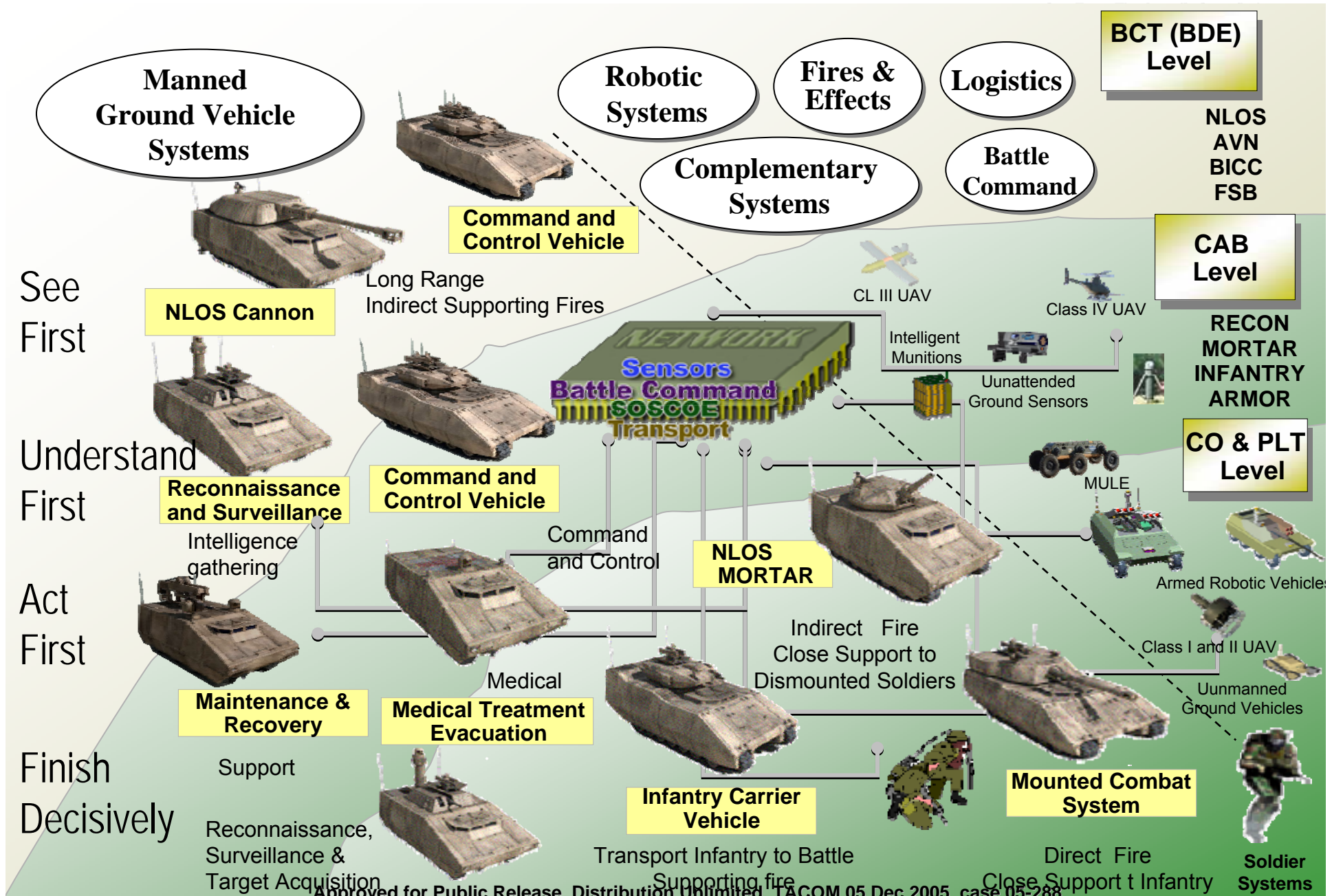
- Transportable by C130/C17/C5 profile
- FCS-equipped BCT Can Fight on Arrival



***Close With And Destroy Enemy Forces To
Seize Terrain And Dominate The Battlefield***

- Battle Command on the Move
- Ubiquitous, Distributed C⁴ISR Network
- Networked Army and Joint Fires
- Overmatch Enemy in All Conditions and Environments
- Mutual Support
- **Integrated Survivability:** Soldiers and Platforms Leverage Integration of Active and Passive systems and Force Protection
- Reduced Sustainment Requirements
- Network Enabled, Embedded, Virtual, Constructive, or Live Training
- **Soldiers as the Centerpiece of the Formation**

FCS Family of Systems



FCS Training Summary...up front

- **Embedded Training is the user's default option**
- **Enabling technologies are sufficiently mature**
- **Procurement strategy is well defined and understood by LSI**
- **Integration is the challenge**

Embedded Training..... a DoD plan ; an Army Commitment



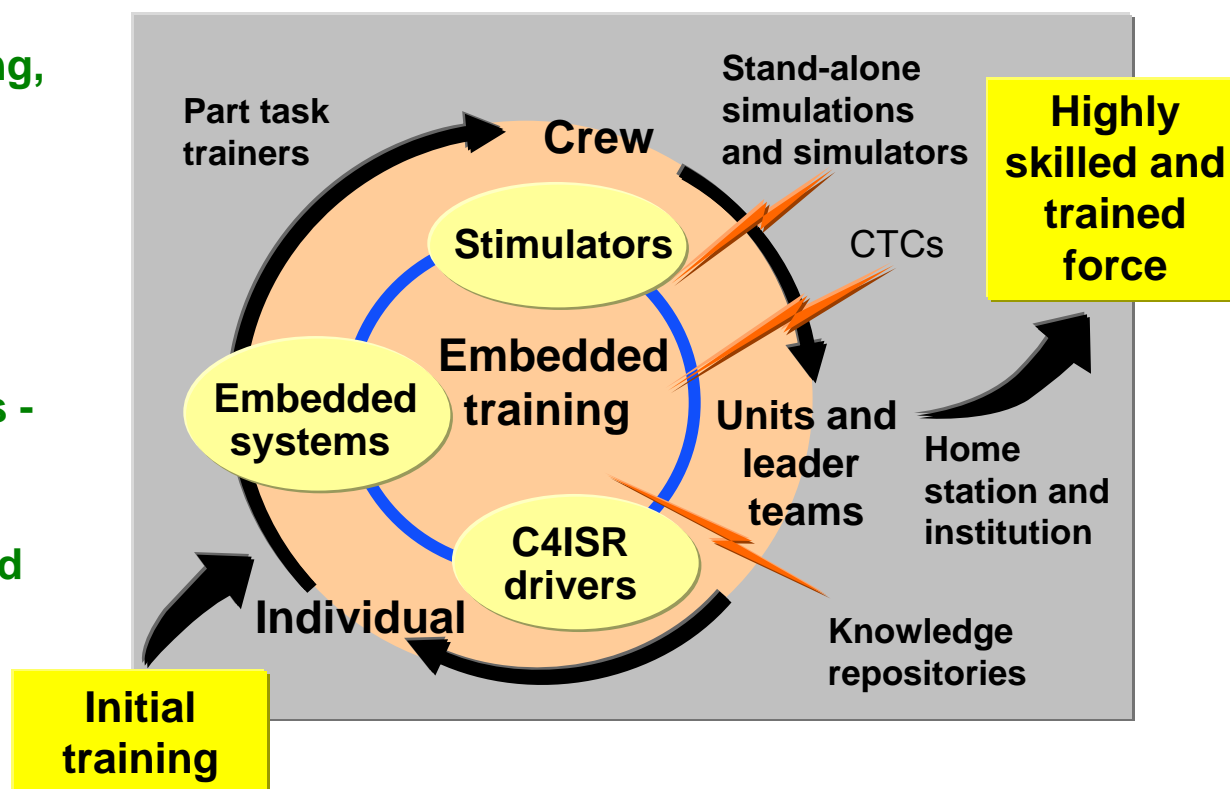
“Build an **Integrated Live, Virtual, and Constructive Training Environment**. The ultimate goal is to develop a transformed training capability that provides accurate, timely, relevant, and affordable training and mission rehearsal in support of specific operational needs. **Training must be a living process with the ability to adapt and respond quickly to the dynamic challenges of the national security environment.** This will require the ability to identify potential crisis situations in real time; conduct course-of-action analyses; utilize **continuously available networks for mission rehearsal, simulation and just-in-time training; and measure performance systematically to improve operational effectiveness.**”

Para 3.2, Strategic Plan for Transforming DoD Training, 1 Mar 02

Expanded training capabilities to enable training anywhere, anytime

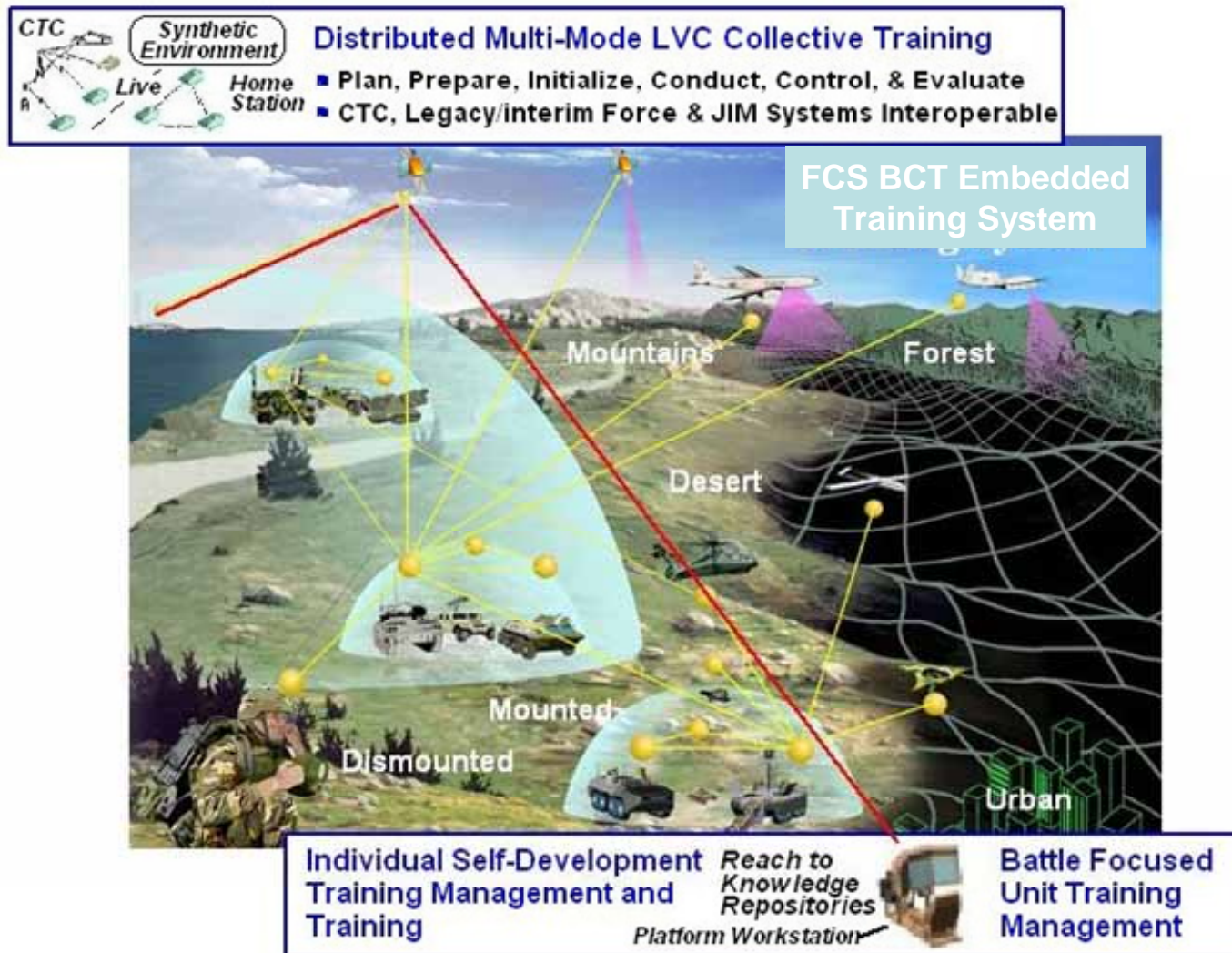
FCS BCT Training Concept

- Expanded training availability using organic, integrated, embedded systems - Training, Operations, and Mission Planning/Rehearsal - for full spectrum training including JIM
- Full range of training task representation - individual, crew, collective, and leaders - embedded or 'reach' via C4ISR system
- Reduced training burden and cost resulting from product line design approach - maximum commonality between operational and training systems



FCS will provide the first Army embedded training capability that supports individual, crew, collective, unit, and leader training

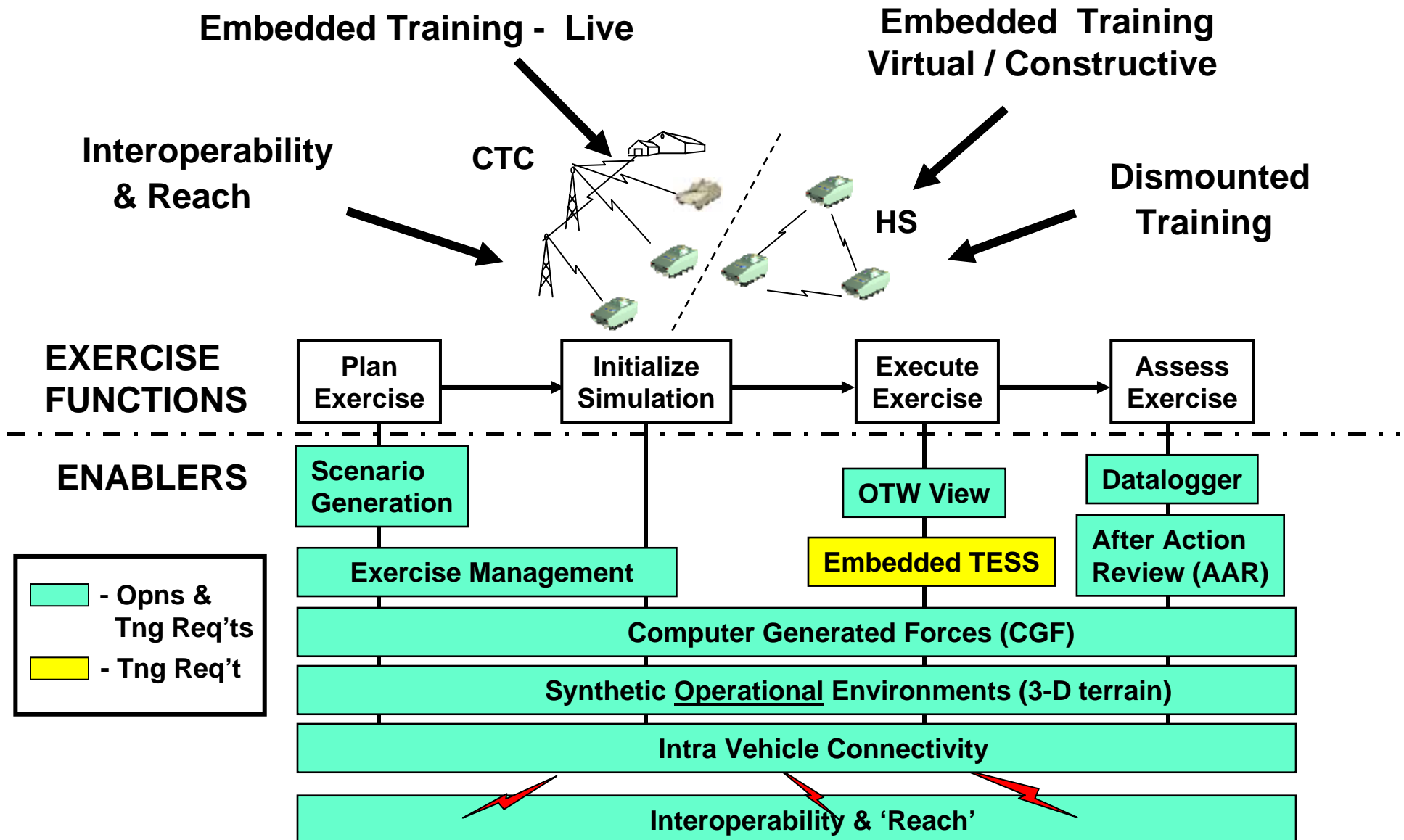
OV-1: Operational Concept Graphic



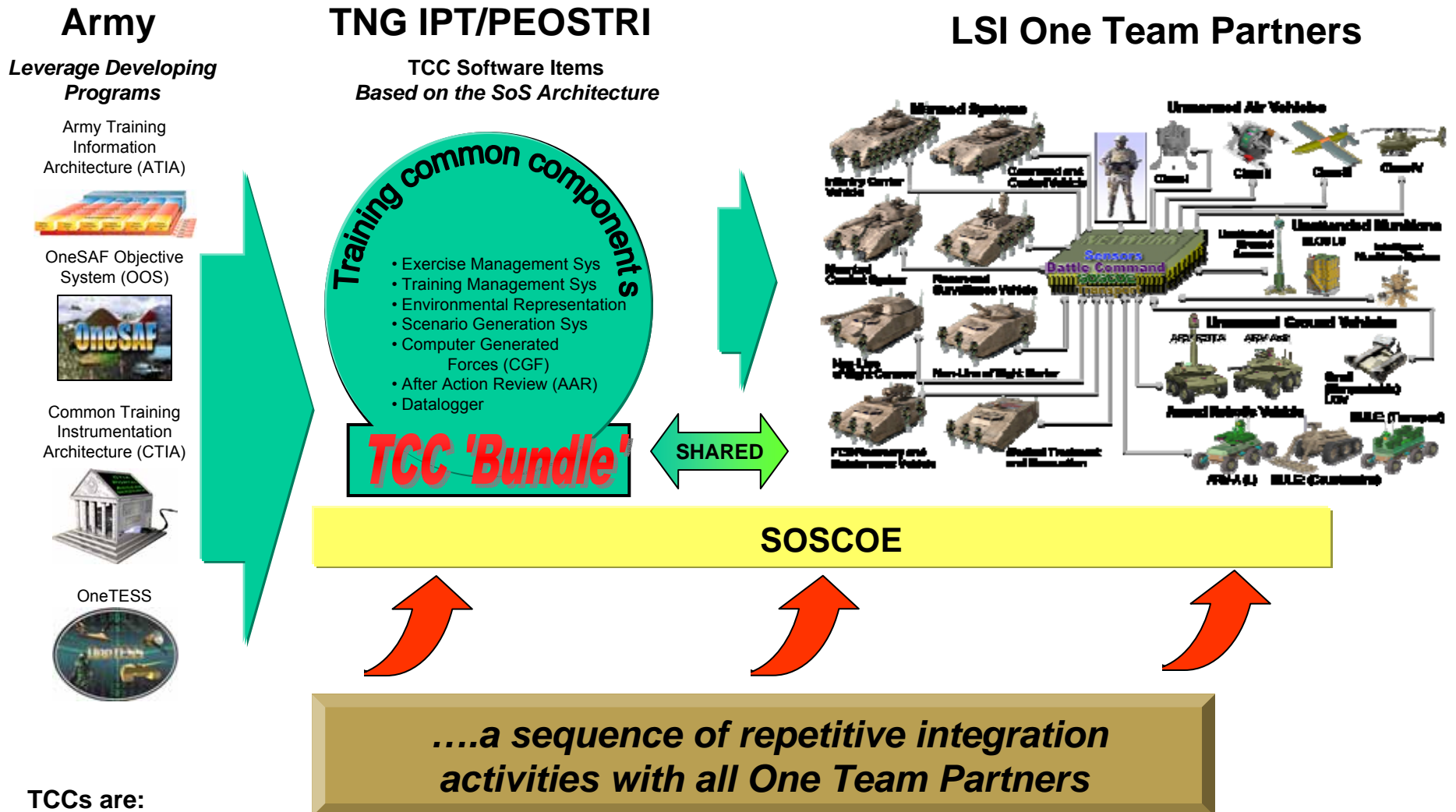
Plus Operational Rehearsal (Battle Command and Embedded Training shared function)

KPP#6: The FCS FoS must have an embedded individual and collective training capability that supports live, virtual and constructive training environments.

KPP Critical Enabling Requirements



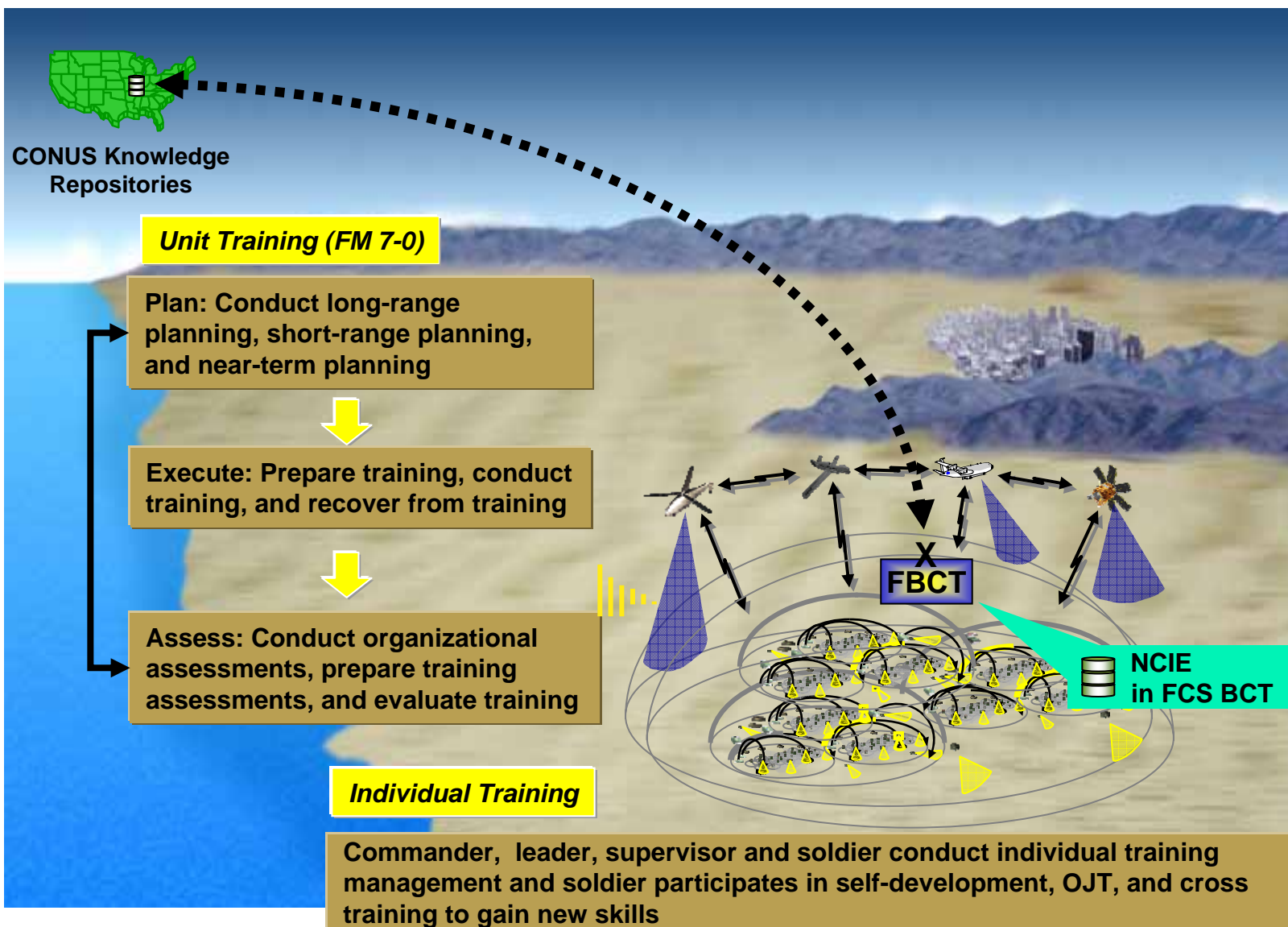
Embedded Training Is Achieved Thru....



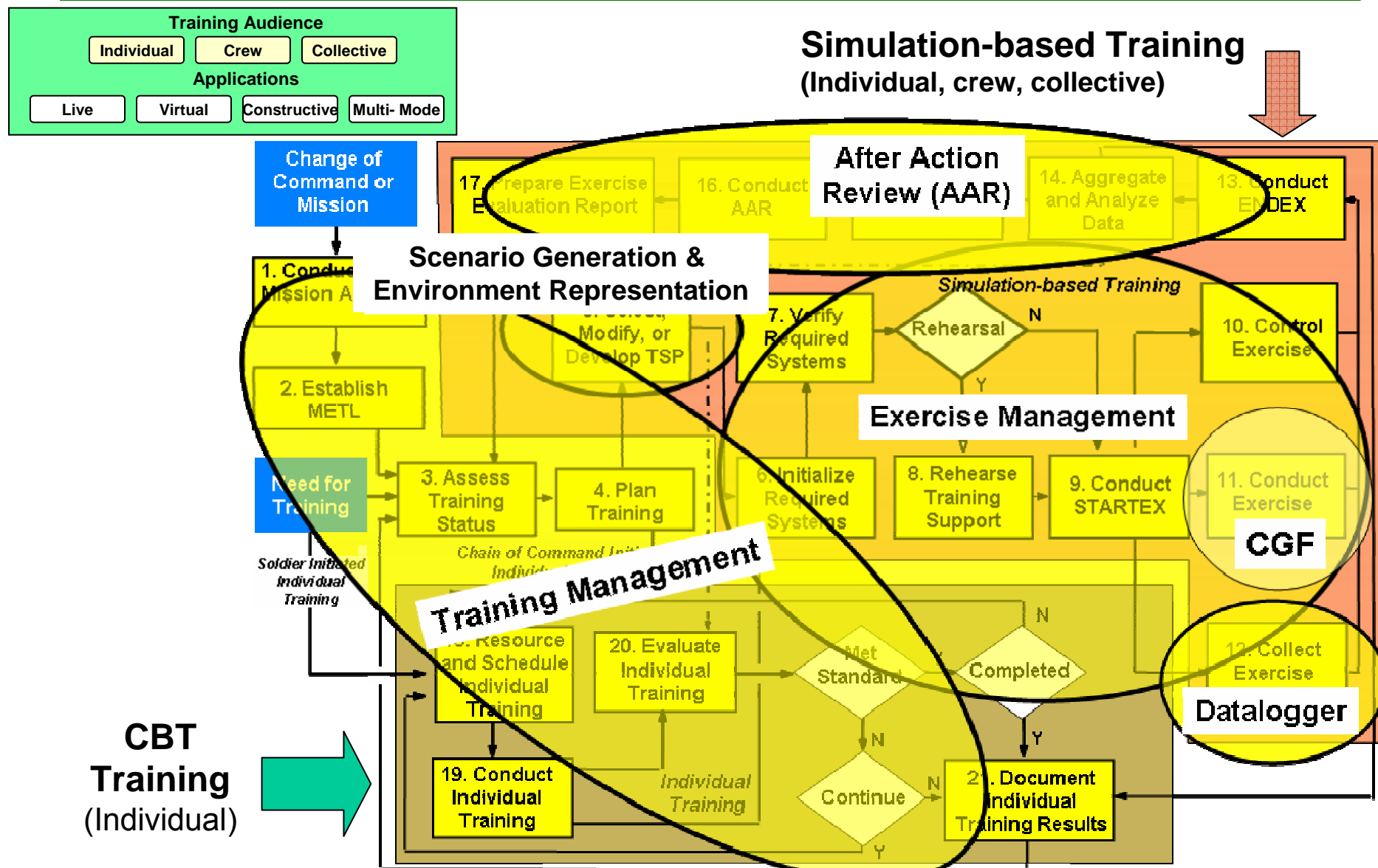
TCCs are:

- A Software item
 - Used on multiple Prime Items (variants)
 - Developed as part of a product line by the TCC OneTeam Partner (PEO STRI) to leverage reuse from an existing (TRL 6) program.
 - Integrated/extended by OneTeam Partners to meet the product team's training requirements in support of a system IAW the SOW.
- Approved for Public Release, Distribution Unlimited, TACOM 05 Dec 2005, case 05-288

IP 10: Conduct Multi-Mode Training OV-1

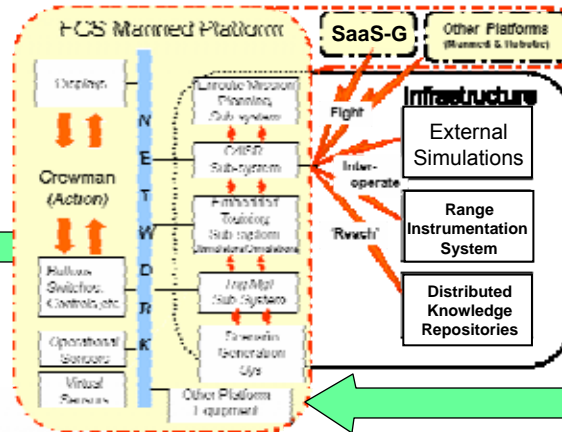


IP 10 Process Flow Covered by Training Common Components (TCCs)

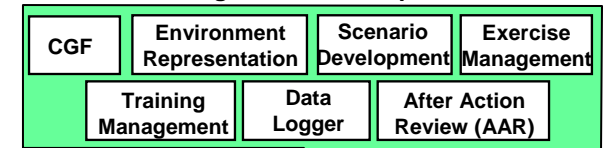


Embedded Training Anywhere, Anytime

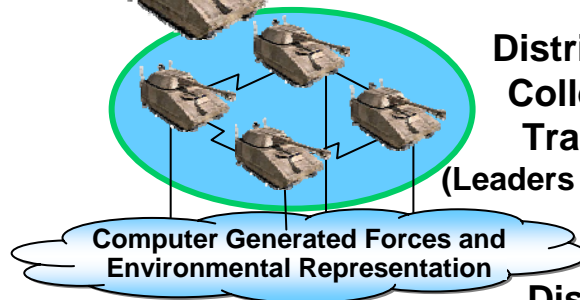
Embedded Task Training (Crews and Soldier)



Training Common Components

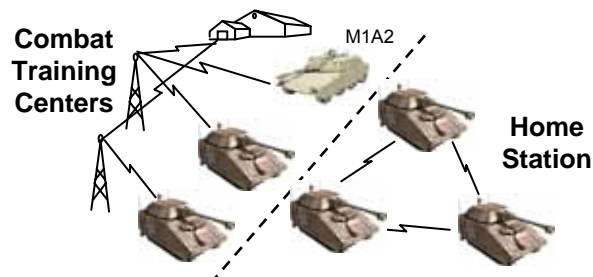


Distributed, Collective Training (Leaders and Units)



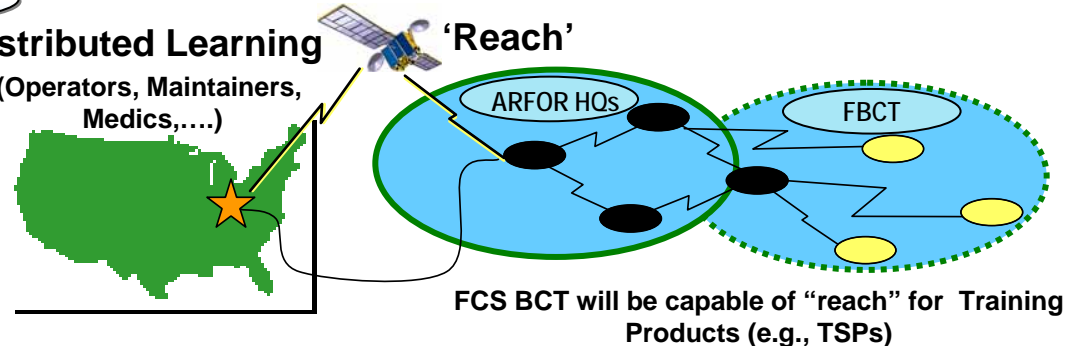
Live Training

[Embedded Tactical Engagement Simulation System (TESS) and CTC Instrumentation Interface]



Distributed Learning

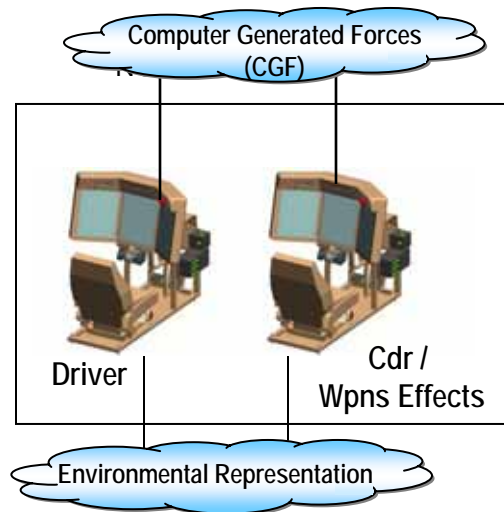
(Operators, Maintainers, Medics,...)



Common, consistent, integrated capabilities

Embedded Task Training

Crews and Soldier



CAPABILITIES

- Individual Computer-Based Training (IETMs/CBTs)
- Mission Systems Trainers (Driver, Weapon, RSTA, C2)
 - Switchable vision blocks provide virtual (out-the-window) view
 - Driver or Crew Chief acts as Instructor
- “Battle Stations” override



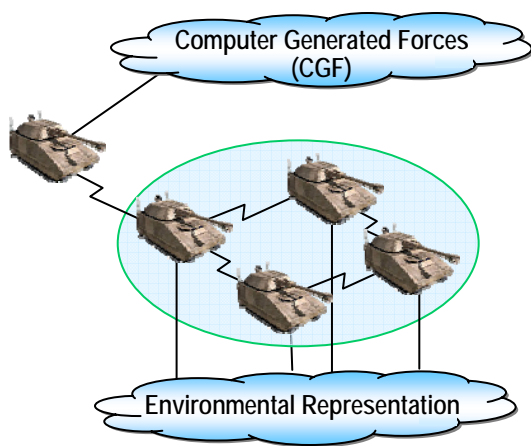
ENABLERS

- Environmental Representations (terrain, littoral, atmosphere, weather) are essential to operations and training. They will be stored on-board FCS platforms.
- Computer Generated Forces embedded on-board will provide external entities necessary to training tasks (e.g., targets, Unmanned Vehicles, dismounted Soldiers).

Individual / crew training utilizes internal system network

Distributed, Collective Training

Leaders and Units



CAPABILITIES

- The FCS-equipped unit will be capable of conducting distributed, collective training in either a virtual or constructive training mode anywhere and anytime.

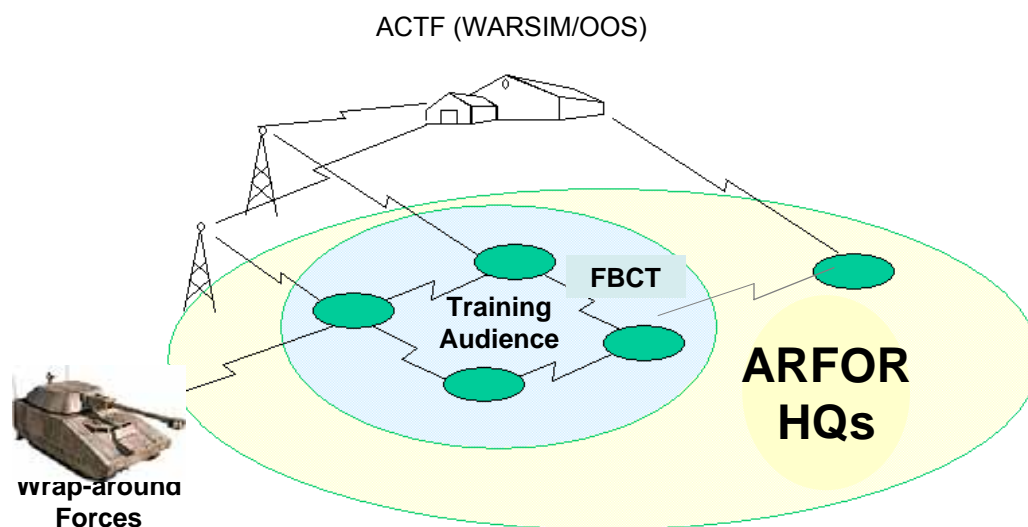
ENABLERS

- Computer Generated Forces- will provide wrap-around friendly combat, combat support and combat service support elements (including joint and coalition) and opposing force elements – to create training in a combined arms environment. CGF can be provided from;
 - (1) on-board,
 - (2) adjacent FCS platform(s) not part of the training audience or
 - (3) by interoperating with external simulation connected by the Network Battle Command system
- Network services (transport layer)
- Battle Command Services must work in training mode

Collective distributed training depends on network services

Live Training

E-TESS

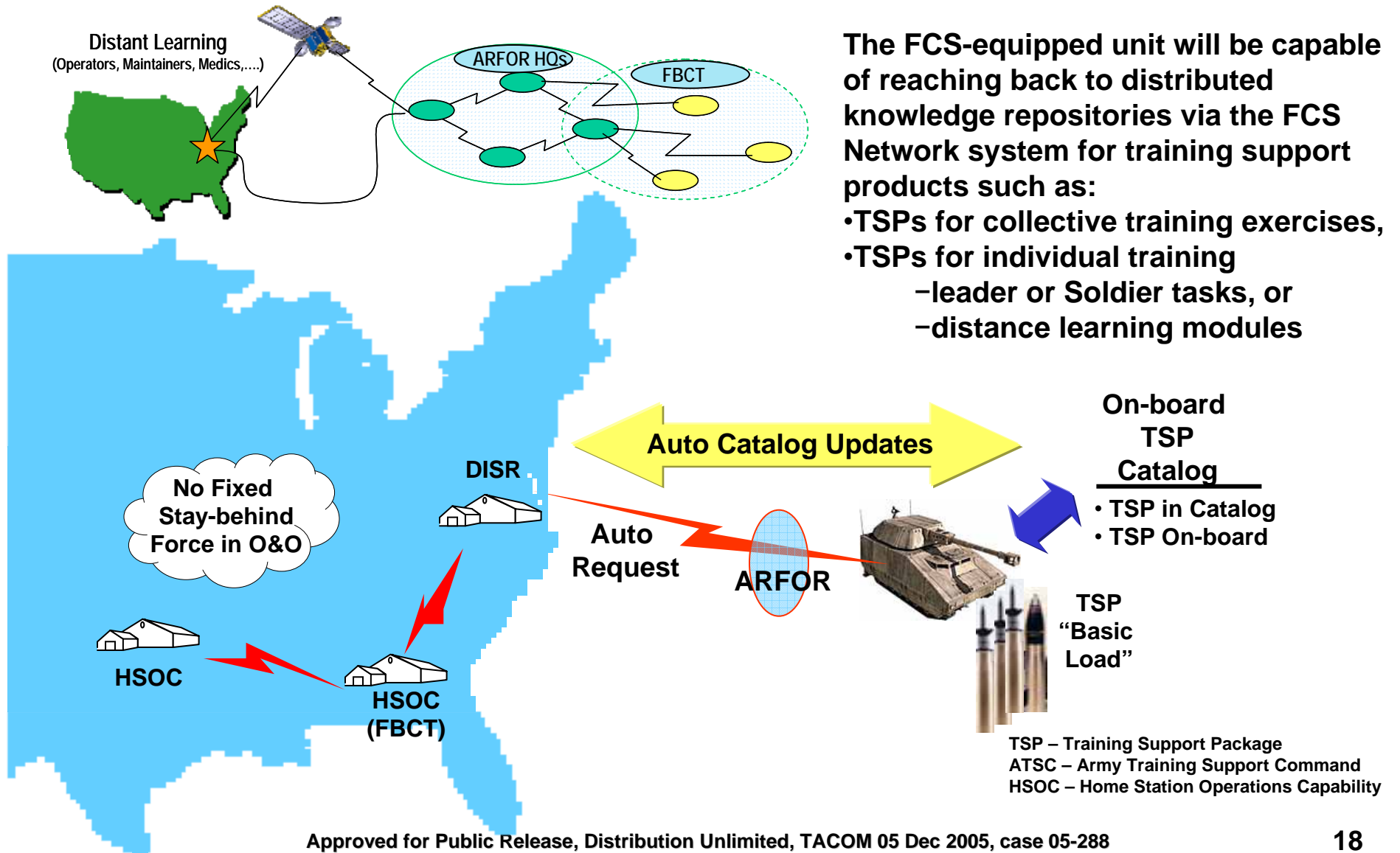


CAPABILITIES

- The FCS-equipped unit will be capable of conducting instrumented live training at home station, at CTCs, and while deployed
- Legacy Multiple Integrated Laser System (MILES/TESS) capabilities (i.e., sensors, eye-safe engagement laser, signature simulator and kill indicator) will be embedded in FCS platforms through dual use of operational Laser capabilities
- The FCS network will be capable of acting as a 'range instrumentation system' connecting all FCS platforms for distributed home station and deployed training or interfacing to the existing instrumentation system at the CTCs
- Absent real supporting or OPFOR entities/units, a separate FCS system, operating in a training mode will provide virtual wrap-around entities/units within the COP (2D view)

Live training can be accomplished at home, CTCs or deployed locations

'Reach'



Training IPT Provides Products

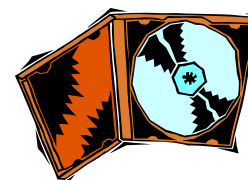
- Mission and Task Analyses (TRADOC, FD, SEI, Suppliers)
- Embedded Training (ET) system (L, V, C)
 - Driver Trainer
 - Weapons Trainer
 - RSTA Trainer
 - Battle Command Trainer

} Each contains a progressive performance matrix (a la Conduct of Fire Trainer)
- Stand-Alone Training Systems (reconfigurable) for those tasks which are unsafe, unaffordable or impractical for embedded training; expected primary support for institutions (L, V)
 - High fidelity
 - Desk-top

} Each Stand-alone trainer reuses Embedded Training (ET) software
- Maintenance Trainers
- Training Support Packages (TSPs) - Individual and Collective
 - Level V Interactive Electronic Technical Manuals (Logistics IPT)
 - Simulation-based Training Support Packages (TSPs)
 - Interactive Multimedia Instruction (IMI)



Common
Embedded
Training
Software



L = Live
 V = Virtual
 C = Constructive

Summary

- **Embedded Training is the user's default option**
- **Enabling technologies are sufficiently mature**
- **Procurement strategy is well defined and understood by LSI**
- **Integration is the challenge**